

Hand Rejuvenation with Fat Grafting

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Summary: Hand rejuvenation with autologous fat grafting has continued to increase in popularity since its description by Fournier in the 1980s. The use of autologous fat has multiple benefits in comparison with dermal fillers, including biocompatibility, availability, revascularization, and long-term results. The authors describe their technique for fat grafting to the hand, using a single access incision combined with the massage technique. Hand rejuvenation with fat grafting should be offered to patients with moderately to severely aged hands as the standard of care. Long-term results have been the changes in the overall skin texture and appearance with the disappearance of visible superficial veins. (*Plast. Reconstr. Surg.* 151: 614e, 2023.)

Hand rejuvenation with autologous fat grafting has continued to increase in popularity since its description by Fournier in the 1980s.¹ The use of autologous fat has multiple benefits in comparison with dermal fillers, including biocompatibility, availability, revascularization, and long-term results.² The safety of fat grafting to the hand and high patient satisfaction has been well-demonstrated.³⁻⁵ For patients requesting hand rejuvenation, fat grafting should be offered as the standard approach to address the physical signs of aging.⁶

The soft tissues of the hand have characteristic changes of aging caused by alterations in the skin, subcutaneous tissue, and musculoskeletal system.^{7,8} The skin demonstrates atrophy, wrinkling, and pigmentation changes attributable to sun exposure. Laser or chemical peels can induce changes in dermal thickening and correction of dyspigmentation in appropriate candidates, but are considered less predictable in their outcomes.^{5,9-12} Aging results in thinning of the dermis, loss of subcutaneous fat, and increased visibility and prominence of superficial veins, extensor tendons, and metacarpal heads. These characteristics are telltale signs of a patient's relative age, with the most important feature of an aged hand being prominent veins.⁸ The changes at the distal aspect of the dorsal hand with deepening of the intermetacarpal spaces can also be

caused by chronic denervation or disuse atrophy of the intrinsic muscles of the hand.¹²

PATIENT EVALUATION

Hand aging can be divided into three stages, classified according to degree of skin atrophy, loss of subcutaneous tissue, and exposure of underlying structures.⁴ For patients with moderate to severe skin atrophy, exposure of veins and tendons, superficial layer or multicompartiment fat loss, or interosseous atrophy, fat grafting can help improve the quality of skin, obscure the visibility of the veins and tendons, and fill voids in the intermetacarpal spaces. The volume of fat augmentation varies, but the provider should aim to overcorrect slightly with the understanding that some volume loss is anticipated with time.^{3-5,12-15} Contraindications include acute hand abnormalities, infections, and blood dyscrasias.¹⁴

Dorsal Hand Compartments

The dorsal hand comprises three laminae, with the superficial veins and sensory nerves in

Disclosure: Dr. Rohrich receives instrument royalties from Eriem Surgical, Inc., and book royalties from Thieme Medical Publishing. Dr. Abraham has no financial incentives or conflicts of interest associated with this article. No funds were received or utilized for the research reported in this article.

Related digital media are available in the full-text version of the article on www.PRSJournal.com.

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Received for publication November 18, 2020; accepted February 17, 2022.

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DOI: 10.1097/PRS.0000000000009996

the dorsal intermediate lamina and the tendons in the dorsal deep lamina.¹⁶ The dorsal superficial lamina is void of critical structures, and augmentation in this layer decreases prominence and visibility of the underlying veins (Fig. 1). The dorsal deep lamina also can be augmented for deepened intermetacarpal spaces as needed. Eight to 12 perforators within vertical septal adhesions traverse the three laminae to perfuse the subdermal plexus and are at risk during the procedure.

Surgical Technique

Setting

In the senior surgeon's (R.J.R.'s) practice, the procedure is performed in the operating room under general anesthesia to optimize sterility and patient comfort, as these procedures are typically performed with additional surgical procedures. However, the procedure can be performed safely with the patient under sedation, with adjunct dorsal wrist blocks with local anesthetics as needed.

Markings

The areas for suction lipectomy are marked preoperatively, typically the medial thigh in our practice because of superior graft take and minimal patient discomfort.¹⁷ The metacarpal rays are marked on the dorsal hand before grafting for anatomic orientation.

Tissue Harvest

The fat is harvested in a sterile fashion with a 10-mL syringe attached to a 14-gauge cannula using dry technique liposuction. We harvest more than 25 mL for each hand, with the goal of grafting 20 to 25 mL. The tissue is centrifuged for 1 minute at 1200 rpm and the fat is isolated for grafting.¹⁴ Centrifuged fat results in better retention and better appearance in comparison with noncentrifuged fat.¹⁵

Fat Grafting

A technical refinement over the past 5 years has been to perform the entire procedure from a single access point. The hand is

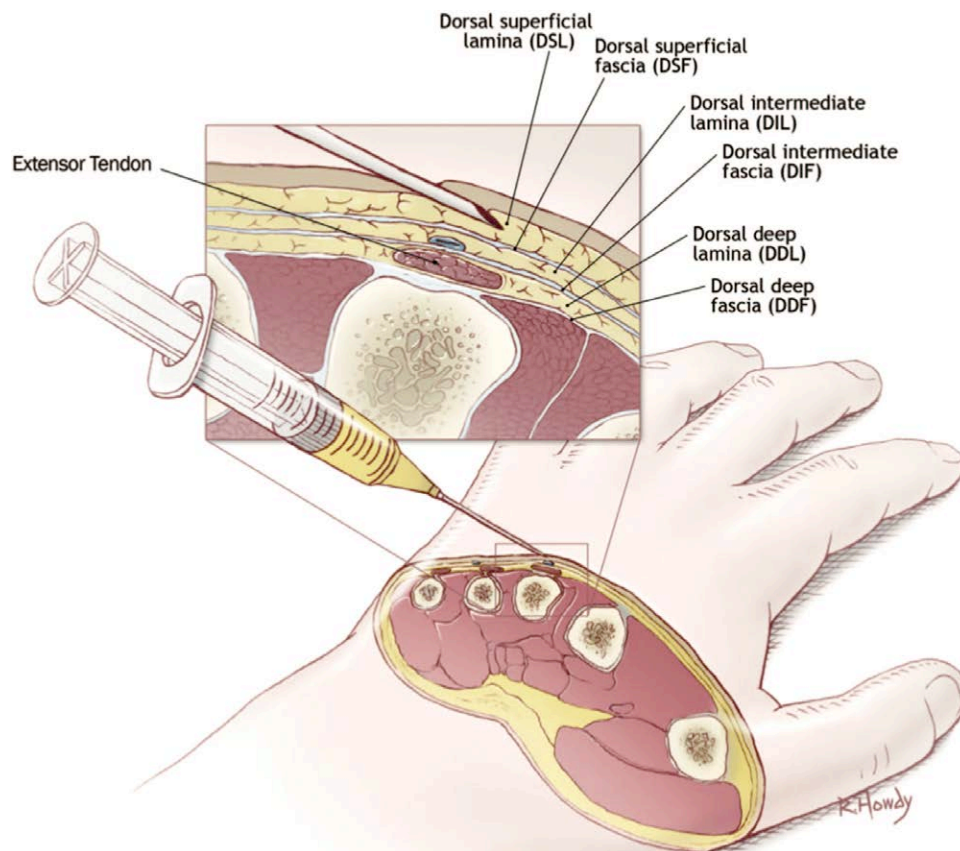


Fig. 1. Anatomy of the dorsal hand laminae. Fat grafting is performed primarily in the dorsal superficial lamina. (Reproduced with permission from Bidic SM, Hatef DA, Rohrich RJ. Dorsal hand anatomy relevant to volumetric rejuvenation. *Plast Reconstr Surg.* 2010;126:163–168.)

prepped and draped in sterile manner; a 14- to 18-gauge needle is used to create a portal incision on the radial or ulnar aspect of the third metacarpal head; and fat is infiltrated into the dorsal superficial and deep laminae, with care taken to avoid injection into the intermediate lamina. The fat is injected with a 10-mL syringe with a 14-gauge blunt tip cannula in both antegrade and retrograde manner throughout the dorsal hand.¹⁴ After infiltration, the access portal is occluded with the nondominant hand to prevent egress, and the fat is massaged within the dorsal superficial lamina for even spread. This is initially performed in the proximal direction and then distally between the metacarpal heads and onto the proximal phalanges. In the experience of the senior author (R.J.R.), this technique decreases the risk of surgical complications by avoiding injury to the structures in the intermediate laminae, and massaging allows for spread of the fat in the superficial and deep laminae, avoiding injury to the vertical septae to decrease risk of bruising. [See **Video (online)**, which demonstrates a fat grafting technique to the dorsal hand].

Postoperative Care

The portal is left open, and the hand is dressed with fluffed gauze dressing in between the fingers and on the dorsal aspect of the hand and is secured in place with a 4-inch Kerlix roll

(Covidien) and an ACE wrap (3M). The dressing is removed at 24 hours, and patients can resume activities of daily living after 48 hours. The patient is instructed to minimize strenuous activity and to keep the hand elevated for at least 72 hours. The senior author (R.J.R.) has been performing this technique for over 10 years with excellent long-term results (see Video and Fig. 2).

Complications

The most typical complications in the recipient bed for hand fat grafting are bruising, swelling, and transient dysesthesias.^{4,5} There are rare reports of infective complications with this procedure.^{18,19} In our experience with more than 200 patients, one patient required additional intervention for excess residual volume, which was managed by making a small stab incision (11 blade) at the area of excess adiposity and manual expression of the fat globule.

CONCLUSIONS

Hand rejuvenation with fat grafting should be offered to patients with moderately to severely aged hands as the standard of care. A single access incision combined with the massage technique simplifies the procedure with excellent results. The most outstanding long-term results have been the changes in the overall skin texture



Fig. 2. The patient underwent 25 mL of fat grafting for rejuvenation. Note the decreased visibility of the superficial veins and tendons and increased volume of the dorsal hand 3 months postoperatively (*right*).

and appearance with the disappearance of visible superficial veins.

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